

WHAT IS CLAIMED IS:

- 1 1. A tissue cutting instrument, comprising:
2 an outer member;
3 an inner member received within the outer member; and
4 a cutter coupled to the inner and the outer members such that rotation of the inner
5 member about an axis causes off-axis movement of the cutter.
- 1 2. The instrument of claim 1 wherein the outer member includes a terminal end at a
2 distal end.
- 1 3. The instrument of claim 2 wherein the terminal end is spherical.
- 1 4. The instrument of claim 2 wherein the terminal end is flat.
- 1 5. The instrument of claim 2 wherein the terminal end defines an opening therein, the
2 terminal end opening including a cutting portion.
- 1 6. The instrument of claim 5 wherein the terminal end opening is formed by a cut into
2 the terminal end.
- 1 7. The instrument of claim 5 wherein the terminal end opening is formed by at least two
2 cuts into the terminal end.
- 1 8. The instrument of claim 7 wherein each of the two cuts is cylindrical, the two cuts
2 being perpendicular to each other.
- 1 9. The instrument of claim 7 wherein each of the two cuts is v-shaped.
- 1 10. The instrument of claim 7 wherein each of the two cuts is flat.

1 11. The instrument of claim 2 wherein the outer member includes a first chamber and a
2 second chamber, the chambers being located in an inner surface of the terminal end of the
3 outer member.

1 12. The instrument of claim 11 wherein each chamber is arch-shaped.

1 13. The instrument of claim 12 wherein the cutter comprises a first shaft and a second
2 shaft, each shaft of the cutter assembling in a respective one of the chambers.

1 14. The instrument of claim 1 wherein the inner member includes a plurality of teeth at
2 its distal end.

1 15. The instrument of claim 1 wherein the inner member rotates axially and the cutter
2 rotates in a direction perpendicular to the direction of rotation of the inner member.

1 16. The instrument of claim 1 wherein the cutter comprises a hollow body, the body
2 defining an opening therethrough.

1 17. The instrument of claim 16 wherein the body comprises a sphere.

1 18. The instrument of claim 16 wherein the cutter opening comprises a cutting portion
2 and an extended portion.

1 19. The instrument of claim 16 wherein the cutter opening is formed by a cut through the
2 cutter.

1 20. The instrument of claim 16 wherein the cutter opening is formed by at least two cuts
2 through the cutter.

1 21. The instrument of claim 16 wherein the cutter opening is molded.

22. The instrument of claim 20 wherein each of the two cuts are circular, the two cuts overlapping to form a cutting portion and an extended portion.

23. The instrument of claim 16 wherein the cutter comprises a first shaft and a second shaft, the shafts being located 180° apart from each other along an outer surface of the cutter.

24. The instrument of claim 23 wherein the first shaft comprises a plurality of teeth extending from an outer circumference of the first shaft.

25. The instrument of claim 24 wherein the inner member includes a plurality of teeth on its distal end, and the teeth of the first shaft of the cutter engage with the teeth of the inner member to move the cutter.

26. The instrument of claim 25 wherein the inner member rotates axially and the cutter rotates in a direction perpendicular to the direction of rotation of the inner member.

27. A method of cutting tissue, comprising:
positioning an outer member such that the outer member is adjacent tissue;
engaging the tissue with a cutter coupled to the outer member, an extended portion of the cutter extending distally beyond a terminal end of the outer member; and
moving the cutter to end-on cut the tissue.

28. The method of claim 27 wherein engaging the tissue comprises slicing into the tissue with the extended portion of the cutter.

29. The method of claim 27 wherein moving the cutter comprises rotating an inner member to cause off-axis movement of the cutter.

30. The method of claim 29 wherein the inner member rotates axially and the cutter rotates in a direction perpendicular to the direction of rotation of the inner member.

1 31. The method of claim 27 wherein moving the cutter comprises engaging the cutter and
2 an inner member while rotating the inner member.

1 32. The method of claim 27 wherein end-on cutting tissue comprises abrading tissue.

1 33. The method of claim 27 wherein end-on cutting tissue comprises slicing, grabbing,
2 and shearing tissue.

1 34. A method of cutting tissue, comprising
2 applying a direct cutting force to tissue with a cutter, and
3 mechanically rotating a member to cause off-axis movement of the cutter to end-on
4 cut tissue.

1 35. The method of claim 34 wherein end-on cutting tissue comprises abrading tissue.

1 36. The method of claim 34 wherein end-on cutting tissue comprises slicing, grabbing,
2 and shearing tissue.

1 37. A tissue cutting instrument, comprising:
2 an outer member having a terminal end;
3 an inner member received within the outer member; and
4 a cutter coupled to the inner and the outer members, the cutter including an extended
5 portion extending distal of the terminal end, the cutter configured and arranged to perform
6 end-on cutting.